Entry approved
Please enter
ce 8-4-06

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented) A communications system, comprising:

a base station configured to output first digital in phase and quadrature phase (I/Q) signals;

an optical connecting unit configured to convert the first digital I/Q signals into optical signals and output the converted optical signals through an optical cable; and

an optical base station coupled to receive the optical signals through the optical cable and configured to convert the optical signals into second digital I/Q signals, and convert the second digital I/Q signals into first RF signals for transmission.

2. (Previously Presented) The system of claim 1, wherein the optical base station comprises:

an optical transceiver configured to convert the optical signals received through the optical cable into the second digital I/Q signals;

a multiplexer/demultiplexer unit configured to demultiplex the second digital I/Q signals outputted from the optical transceiver;

an up-converter configured to convert and filter output signals of the multiplexer/demultiplexer unit and output the first RF signals;

a High Power Amplifier (HPA) configured to amplify the first RF signals outputted by the up-converter; and

a duplexer configured to filter the amplified first RF signals and provide the filtered output to an antenna.

3. (Previously Presented) The system of claim 2, wherein the optical base station further comprises:

a plurality of duplexers configured to remove a noise component of second RF signals collected by a corresponding plurality of antennas;

a plurality of Low Noise Amplifiers (LNAs) configured to amplify the second RF signals outputted from the plurality of duplexers; and

a plurality of down-converter units configured to band-pass filter, down-convert and analog to digital convert, the second RF signals outputted from the plurality of LNAs.

4. (Original) The system of claim 3, wherein the optical base station further comprises a clock unit configured to provide a synchronous signal to the multiplexer/demultiplexer unit.

5. (Original) The system of claim 4, wherein the optical base station further comprises a reference clock unit configured to provide the synchronous signal of the clock unit to the up-converter unit and the plurality of down-converter units.

6. (Original) The system of claim 2, wherein the antenna comprises a diversity antenna.

7. (Previously Presented) The system of claim 1, wherein the optical connecting unit comprises:

a multiplexer/demultiplexer configured to multiplex the first digital I/Q signals;

an optical transceiver configured to convert output signals of the multiplexer/demultiplexer into the optical signals and transmit the optical signals through the optical cable to the optical base station; and

a clock unit configured to provide a synchronous signal to the multiplexer/demultiplexer unit.

8. (Previously Presented) The system of claim 7, wherein the optical transceiver is further configured to receive optical signals from the optical base station and convert the received optical signals into third digital I/Q signals to be transmitted to the base station.

9. (Previously Presented) The system of claim 1, wherein the optical connecting unit receives the first digital I/Q signals from at least one channel card of the base station.

10. (Previously Presented) The system of claim 1, wherein the optical base station and the optical connecting unit are digital interface-based devices.

11. (Currently Amended) A signal transmitting method for a communications system, comprising:

converting first digital I/Q signals outputted from a base station into optical signals;

transmitting the optical signals through an optical cable to an optical base station;

converting the optical signals received through the optical cable into second digital I/Q signals;

converting the second digital I/Q signals into RF signals; and

transmitting the [[RF s]] RF signals through an antenna.

12. (Previously Presented) The method of claim 11, wherein converting the second digital I/Q signals to RF signals comprises:

demultiplexing the second digital I/Q signals;

converting the demultiplexed signals to analog signals;

band pass filtering the analog signals to generate the RF signals;

high-power amplifying the RF signals; and

filtering the amplified RF signals.

13. (Previously Presented) The method of claim 12, wherein demultiplexing is performed in accordance with a synchronous signal.

14. (Previously Presented) The method of claim 11, wherein converting the first digital I/Q signals to the optical signals comprises multiplexing the first digital I/Q signals.

15. (Original) The method of claim 14, wherein multiplexing is performed in accordance with a synchronous signal.

16. (Original) The method of claim 11, wherein the antenna comprises a diversity antenna.

17. (Previously Presented) The method of claim 12, further comprising receiving RF signals through the antenna.

18. (Currently Amended) A signal receiving method for a communications system, comprising:

receiving RF signals through an antenna of a remote base station;

converting the received RF signals to first digital electronic signals;

converting the first digital electronic signals to digital optical signals;

transmitting the digital optical signals over an optical link to an optical connecting unit;

converting the digital optical signals to second digital electronic signals in the optical ~~coupling~~ connecting unit, the second digital electronic signals including in phase and quadrature phase (I/Q) signals; and

providing the second digital electronic signals from the optical ~~coupling~~ connecting unit to a base station.

19. (Original) The method of claim 18, wherein the optical link comprises an optical cable.

20. (Canceled)

21. (Previously Presented) The method of claim 18, wherein the antenna comprises a diversity antenna.

22-25. (Canceled)

26. (Previously Presented) A signal transmitting method in a communication system, comprising:

receiving digital I/Q signals from a base station;

converting the digital I/Q signals to optical signals in an optical connecting unit;

transferring the optical signals over an optical cable to a remote station; and

converting the optical signals into RF signals for transmission.

27. (Canceled)

28. (Previously Presented) The method of claim 26, wherein converting the optical signals comprises:

converting the optical signals into analog signal;

demultiplexing the analog signals;

up converting and filtering the demultiplexed analog signals to generate the RF signals; and

amplifying and filtering the RF signals.

29. (Previously Presented) The method of claim 26, wherein converting the digital I/Q signals comprises multiplexing the digital I/Q signals and inputting the multiplexed digital I/Q signals into an optical transceiver to generate the optical signals.

30. (Previously Presented) The method of claim 26, further comprising:

receiving external RF signals through an antenna coupled to the remote station;

converting the external RF signals to second optical signals;

transferring the second optical signals to the optical connecting unit; and

converting the second optical signals to second digital I/Q signals.

31. (Previously Presented) A communication system, comprising:

an optical connecting unit, configured to receive first digital I/Q signals and convert the first digital I/Q signals into first digital optical signals; and

a remote base station, coupled to receive the first digital optical signals and configured to convert the first digital optical signals to first analog RF signals for transmission.

32. (Previously Presented) The system of claim 31, wherein the base station is further configured to receive second RF analog signals and convert the second analog RF signals to second digital optical signals, and wherein the optical connecting unit is coupled to receive the second digital optical signals and further configured to convert the second digital optical signals to second digital I/Q signals for transmission.

33. (Previously Presented) A communication system, comprising:

an optical connection unit, configured to convert first digital I/Q signals to first optical signals and to convert second optical signals to second digital I/Q signals; and

a remote base station, coupled to receive the first optical signals, and configured to convert the first optical signals to third digital I/Q signals, convert the third digital I/Q signals to first RF signals, transmit the first RF signals, receive second RF signals, convert the second RF signals to fourth digital I/Q signals, and convert the fourth digital I/Q signals to the second optical signals.

34. (Original) The system of claim 33, further comprising an optical link coupling the optical connecting unit to the remote base station.

35. (Original) The system of claim 33, wherein the remote base station comprises a diversity antenna.

36. (Previously Presented) The system of claim 33, wherein the optical connecting unit comprises a multiplexer configured to multiplex the first digital I/Q signals and a demultiplexer configured to demultiplex the second digital I/Q signals, and wherein the remote base station comprises a demultiplexer configured to demultiplex the third digital I/Q signals and a multiplexer configured to multiplex the fourth digital I/Q signals.

37. (Previously Presented) The system of claim 7, wherein the multiplexer/demultiplexer converts the first digital I/Q signals from parallel to serial.

38. (Previously Presented) The method of claim 11, wherein converting the first digital I/Q signals comprises converting the first digital I/Q signals from parallel to serial.

39. (Canceled)

40. (Previously Presented) The method of claim 26, wherein converting the digital I/Q signals comprises converting the digital I/Q signals from parallel to serial.

41. (Previously Presented) The system of claim 31, wherein the optical connecting unit converts the first digital I/Q signals from parallel to serial.

42. (Previously Presented) The system of claim 33, wherein the optical connecting unit converts the first digital I/Q signals from parallel to serial.